

Stratigraphy and Sedimentation

EES 4750/5750

Instructor: Dr. Robert Mahon, Department of Earth and Environmental Sciences
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Office Location: GP1062
Office Hours: Monday 11:00-13:00 GP1062, Wednesday 11:00-13:00 EN822

Meeting times: Tuesday, Thursday, 11:00-12:15 GP1056

Lab: Friday 12:00-14:40 GP1056

Field trip: April 9 early morning -12th late evening

Final exam: May 12th, 10:00 am – 12:00 pm

Aim: Students will learn to make detailed observations of stratigraphic deposits from grain to outcrop to basin scales. Students will learn the forms and processes inherent to depositional environments ranging from terrestrial, coastal, to deep marine settings. Finally, students will develop the intuition necessary to link stratigraphic observations with depositional process and environment in order to interpret stratigraphic sequences at all scales.

Learning Objectives: Upon completion of this course, you will be able to:

- observe and describe sediments
- characterize weathering and transport regimes from sediment sorting and maturity
- understand kinematics of fluvial bedforms and bedload
- understand the mechanics of deltaic sedimentation
- understand the driving mechanisms of turbidity currents
- observe and describe sedimentary rocks and sedimentary structures
- characterize constituents of carbonate and clastic sediments
- place observations into various nomenclature schemes to name sedimentary rocks
- measure and describe stratigraphic sections
- draft a stratigraphic column
- apply Walther's law of the succession of facies to determine presence of discontinuities in stratigraphic successions
- understand eustacy, subsidence, and accommodation in the context of preservation and geometries of sedimentary sequences
- apply principles of conservation of sediment mass to sedimentary basins
- interpret possible depositional environments of sedimentary sequences from observations
- understand the principles and practices and interpretation of stratigraphic nomenclature

Course Evaluation

Grading: Total class grade: over 90% = A, 80-89.9% = B, 70-79.9% = C, and 60-69.9% = D.

All grades and course material will be made available through the course page on Moodle. Please check this site and your student email regularly.

Extra Credit: No extra credit will be offered under any circumstances.

Labs (35%): The laboratory will be a significant part of your overall course grade. There will be 11 laboratory assignments and one lab practical exam at the end of the semester. The lab practical will

be worth 15% of your course grade, while lab assignments will be worth a total of 20% of your course grade.

Exams (35%): There will be three exams throughout the semester. Exam 1 will cover siliciclastic sediments, depositional environments and strata and will be worth 10% of the course grade. Exam 2 will cover carbonate depositional environments and strata and will be worth 10% of the course grade. The final exam will be summative and will be worth 15% of the course grade. Final exam will be according to the UNO Examination schedule, *Tuesday May 12th from 10:00 am - Noon.* Expect exams to include questions on topics covered in lectures, labs, assignments, and the field trip.

Assignments and participation (10%): There will be several smaller scale assignments throughout the course of the semester. Some will be given as in-class exercises, others as take-home tasks. Their point value will be individually determined based on scope.

Field Trip (20%): There will be a class field trip to the Ouachita and Ozark mountains in Arkansas from *April 9-12th*. This fieldtrip will allow you to observe sedimentary rocks in the field and allow you to develop your observational and interpretational skills. This field trip is considered mandatory. Students will give a group talk on the last class day, describing the geologic history of the region in the context of observations made during the trip. Participation in the trip discussions and this final talk will constitute 20% of the course grade. Additional exercises based on your observations and interpretations in the field will be assigned, both during and after the trip as part of the assignment and the lab components of the course grade. As such, detailed notes, observations, sketches, and photographs should be taken and catalogued during your field trip.

Textbook: No textbook purchase will be required for this course. I will refer to Boggs, Principles of Sedimentology and Stratigraphy (ISBN-10: 0321643186) often and will provide a class set for your reference. Please do not remove textbooks from the classroom to ensure they remain available.

Late Assignment Policy: Any assignment turned in after the specified due date (at the beginning of class) will be considered late, an assignment not handed in by the end of the day it is due will not be accepted without a valid University excuse. Make-ups will only be given for verifiable written excuses specifically recognized by the University (illness of the student, or of an immediate family member, death of an immediate family member, participation on trips related to certain University functions, major religious holidays). If you miss any classes, you must promptly notify me to make up the material. Make-ups after one week has passed will be permitted only under extenuating circumstances.

Class Attendance: Class attendance is considered mandatory, except in the case of University approved absence.

Academic Honesty: Academic integrity is fundamental to the process of learning and evaluating academic performance. Academic dishonesty will not be tolerated. Academic dishonesty includes, but is not limited to, the following: cheating, plagiarism, tampering with academic records and examinations, falsifying identity, and being an accessory to acts of academic dishonesty. Refer to the Academic Dishonesty Policy (<http://www.uno.edu/student-affairs/documents/academic-dishonesty-policy-rev2014.pdf>) for further information. The University policies and procedures

regarding academic dishonesty are clearly defined in the University Code of Conduct:
<http://www.uno.edu/student-affairs/documents/Student-Code-of-Conduct-rev-7-16.pdf>

Students with disability: It is University policy to provide, on a flexible and individual basis, reasonable accommodations to students who have disabilities that may affect their ability to participate in course activities or to meet course requirement. Students with disabilities should contact the Office of Disability Services (LIB 120) as well as their instructors to discuss their individual needs for accommodations. See the UNO Policy for Students with Disabilities at <http://www.ods.uno.edu/>

Topics and tentative schedule:

1/14	Intro		
1/16	Weathering and sediments	11/17	Lab #1 Siliciclastic sediments
1/21	Sediment transport		
1/23	Sedimentary structures	1/24	Lab #2 Bed forms (meet in EN125)
1/28	Siliciclastic environments – Glaciers		
1/30	Siliciclastic environments – Fans	1/31	Lab #3 Fans and deltas
2/4	Siliciclastic environments – Rivers		
2/6	Siliciclastic environments – Deltas	2/7	Lab #4 Turbidity currents (meet in EN125)
2/11	Siliciclastic environments – Coasts		
2/13	Siliciclastic environments – Submarine	2/14	Lab #5 Siliciclastic rocks
2/18	Siliciclastic environments – Aeolian		
2/20	Exam 1 – Clastics	2/21	No lab
2/25	No class – Mardi Gras		
2/27	No class – Mardi Gras	2/28	No lab – Mardi Gras
3/3	Carbonate systems		
3/5	Invertebrates	3/6	Lab #6 Carbonate constituents
3/10	Non-skeletal allochems and cements		
3/12	Carbonate environments – Peritidal	3/13	Lab #7 Carbonate rocks I
3/17	Carbonate environments – Platforms		
3/19	Carbonate mineralogy and chemistry	3/20	Lab #8 Carbonate rocks II
3/24	Evaporites and diagenesis		
3/26	Non-marine environments	3/27	Lab #9 Evaporites and diagenesis
3/31	Carbonates through time		
4/2	Exam 2 – Carbonates	4/3	Lab #10 Stratigraphic columns
4/7	Conservation of mass & accommodation		
4/9	No class – Field trip	4/10	No lab – Field trip
4/14	Eustasy, subsidence		
4/16	Sequences	4/17	Lab #11 Sedimentary Basins
4/21	Stratigraphic nomenclature		
4/23	Basin analysis	4/24	Lab practicum
4/28	No class – complete field trip project		
4/30	No class – complete field trip project	5/1	Field trip presentation
5/12	Final exam 10:00 am-12:00 pm		



Spring Semester Important Dates*

Last day to adjust schedule w/out fee -	01/12
Semester Classes Begin -	01/13
Last day to adjust schedule w/fee, or withdraw with 100% refund -	01/23
Last day to apply for May Commencement -	03/01
Final day to drop a course or resign -	03/13
Mid-Term grades due -	03/04
Last Day of Classes -	05/04
Final examinations -	05/07-05/13
Commencement -	05/15

Session "B" Important Dates*

Last day to apply for May Commencement -	03/01
Semester Classes Begin -	03/16
Last day to adjust schedule w/out fee -	03/15
Last day to adjust schedule w/fee, or withdraw with 100% refund -	03/20
Final day to drop a course or resign -	04/06
Mid-Term grades due -	04/03
Last Day of Classes -	04/30
Final examinations -	05/05-05/06
Commencement -	05/15

*Note: check [Registrar's website](#) for items not listed here.

Spring Semester Holidays

Martin Luther King Holiday -	01/20
Mardi Gras Holiday/Spring Break -	02/24 – 02/29
Good Friday Holiday -	04/10-4/12

Withdrawal Policy – Undergraduate only

Students are responsible for initiating action to resign from the University (withdraw from all courses) or from a course on or before dates indicated in the current Important Dates calendar. Students who fail to resign by the published final date for such action will be retained on the class rolls even though they may be absent for the remainder of the semester and be graded as if they were in attendance. Failure to attend classes does not constitute a resignation. Check the dates and charges associated on the [Registrar's website](#).

Incomplete Policy – Undergraduate only

A grade of I is assigned when, due to extenuating circumstances beyond their control, students engaged in passing course work are unable to complete class assignments within the time frame of the course's session. Before agreeing to the use of an incomplete grade in any course, an Incomplete Grade Agreement Form must be completed. Details regarding deadlines for completing the I grade, when the incomplete converts to a grade of F, and a link to the form may be found on the [Academic Affairs](#) website.

Repeat Policy

When a student is permitted to repeat a course for credit, the last grade earned shall be the one which determines course acceptability for degree credit. A student who has earned a C or better in a course may not repeat that course unless, (1) the catalog description indicates that the course may be repeated

for credit, or (2) the student's Dean gives prior approval for documented extenuating circumstances.

Graduate Policies

Graduate policies often vary from undergraduate policies. To view the applicable policies for graduate students, see the [Graduate Student Handbook](#).

Academic Dishonesty Policy

Policies for academic conduct [are here](#).

Safety Awareness Facts and Education

Title IX makes it clear that violence and harassment based on sex and gender is a Civil Rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, etc. If you or someone you know has been harassed or assaulted, you will find [Resources for Survivors here](#).

UNO Counseling Services and UNO Cares

UNO offers care and support for students in any type of distress. [Counseling Services](#) assist students in addressing mental health concerns through assessment, short-term counseling, and career testing and counseling. First-year students often have unique concerns, and UNO Cares is designed to address those students' needs. Contact [UNO Cares](#).

Emergency Procedures

Sign up for emergency notifications via text and/or email at [E2Campus Notification](#). All emergency and safety procedures are explained at the [Emergency Health and Safety Office](#).

Diversity at UNO

As the most diverse public university in the state, UNO maintains a Diversity Affairs division to support the university's efforts towards creating an environment of healthy respect, tolerance, and appreciation for all people, and the expression of intellectual point of view and personal lifestyle. The [Office of Diversity Affairs](#) promotes these values through a wide range of programming and activities.

Learning and Support Services

Help is within reach in the form of learning support services, including tutoring in writing and math and other supplemental instruction. Visit the [Learning Resource Center](#) in LIB 126.

Affirmative Action and Equal Opportunity

UNO is an equal opportunity employer. The Human Resource Management department has more information on UNO's compliance with federal and state regulations regarding EEOC in its [Policies and Resources website](#).